CODE No. 27-32

On Her Majesty's Service

The first Factory Orders issued by William Congreve 1788

Orders relative to the Royal Powder Mills at Waltham Abbey.

1101/1.

1st. The Glooms are to be set into their proper places in the Stoves; but the Brickwork is not to be Compleated untill there is no danger to be apprehended from the Frost.

2d. The Weighing Houses are to be lined up to the Bottom of the tie Beams, and those Beams are to be plained, the Porches of the Stoves are to be lined as high as the lining in the Weighing Houses, and the Walls in each are to be Plaistered and the Roofs Ceiled up to the Rafters, but not until the Frosts are over.

3d. The Iron Nails which are now in the several Troughs &c.a in the Corning House are to have their heads Counter-sunk and Puttied over, or to be Battened over.

4th. There must be a Capsten provided similar to the one already set up in the Corning House, but it is not to be fixed up until further Orders.

5th. The Dusting Reel is to be lined with Canvas, without using any Nails thereon if possible.

6th. The Stone Runners which Mr. Bennett thinks can be taken out of the Iron Rings, and fitted for the Kings Mill at Faversham are to be laid ready for Embarkation.—

7th. A Temporary Watch Box must be provided for the Warder at the Field Gate.—

8th. Mr. Bennett will Order four Bells for the Watch; and three Screws for the Corning House Presses, two left handed ones & one Right hand thread also the Nutts &c.a Compleat and such other Iron-work as he may want

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9th Mr. Bennett will inform Mr. Wright what Timber Messrs. Adam have served in, that was not Demanded for His Majesty's Service, and Mr. Wright will please to desire Messrs. Adam to take such unnecessary Timber away and in future to send in only such as is Demanded from time to time according to the Established Custom at the Royal Powder Mills at Faversham. —

10th That public Notice be stuck up about the Town and places adjecent, that 5 Guineas Reward be given to any Person who shall Inform against any body, that shall pull down or injure the Wharfing at or near the Sluices of the Inlets to the Mill Stream, to any injury to the said Sluices, or any other Premises belonging to His Majesty. —

11th That the Rack-work, Cover to the same & other Carpenters work to be put into Repair at Thoroughgood Sluice & such Wharfing as may be necessary at the other Sluices.

12th That a Gate be put near to the 2 Inlet to prevent Cattle passing. —

13th That Penstock Gates be put down in Hooks Marsh Ditch & that a fence be made from the said Penstock to the End of the Ditch to prevent Cattle passing, & that the Bottom of that part of the Ditch be raised of a sufficient height to prevent a loss of Water thro' the said Ditch.

14th That good Locks be provided for the Sluices where found necessary. —

(sign'd) Wm Congreve
Deputy Comptroller.

Waltham Abbey
9th Feb:y 1788. —

	£	Per bbl of gunpowder. £ s d
Interest upon £100 the first cost of the building at £4 per cent per annum	16,	or " " " " - 512
The daily pay of 5 men - - - - - - - -	200,	or " " " 1/2 - 4
Repairs to the building and utensils - -	20,	or " " " " - 64
Total	£236,	or " " " 1 3/4 - 552.

Charge Magazines

*A charge magazine is a brick building having a buck arched roof, and the interior is lined with wood; it is 24 feet long, 10 feet broad, and has benches on either side, upon which the charge tubs containing the mill charges are placed, as shewn on the drawing numbered 11. After the composition has been mixed at the mixing house into charges of 42 lbs it is brought to this building; and after undergoing the process of amalgamation at the gunpowder mills. it is again returned to these magazines, from whence it is taken to the corning house to be prefsed, and granulated. Every two gunpowder mills have a charge magazine attached, and the expence of erecting one is about £100. *drawing 11

Process of Amalgamating or Incorporating the Composition.

*The buildings in which this operation is carried on are called gunpowder mills; they are each 58 feet long, 10 feet wide, and are worked by water, the water wheel being placed in the centre of each building, thereby dividing it into two equal parts, which are occupied by the stone runners, stone beds &c. The foundations are built of brick upon oak piles, and the water courses of stone; the framing, covering, and roofs, are entirely built of wood: The following wheels &c, compose the machinery of a gunpowder mill, and are shewn on the drawing of that building numbered 12. *drawing 12.

The water wheel marked A receives the impulse of the water upon its float-boards, and is generally 17 feet in diameter, and 8 feet wide for a fall of 6 feet; it makes 5 1/3 revolutions per minute.

BB are 2 pit wheels 6 feet 10 inches in diameter and each has 72 cogs. (In all millwrights work the wheels are calculated according to the number of cogs or teeth.) These wheels are fixed upon the water wheel shaft, and make 5 1/3 revolutions per minute.

CC are 2 wallow-nuts fixed upon the upright shafts I, and are turned by the pit wheels B, they are 4ft 4in in diameter, each has 44 cogs, and each makes 8 3/4 revolutions per minute.

DD are called the crown wheels or the wallows, being fixed upon the same shafts; they are 7 feet 3 inches in diameter, each has 78 cogs, and each makes

makes 8 3/4 revolutions per minute.

EE are called the crown wheels over the stones, they are fixed upon the shafts K, are 8 feet 1/2 inch in diameter, each has 90 cogs, and each makes 7/2 revolutions per minute.

FFFF are 4 circular stones, about 6 feet in diameter, 1 foot 6 inches thick and each weighs about 3 1/2 tons. These are called the stone runners.

GG are 2 circular stones, about 8 feet 3 inches in diameter, 1 foot 2 inc. thick, and each weighs about 3 1/2 tons; they are called the stone beds are laid horizontally, and 2 stone runners run round upon each stone bed.

Some of the stone beds and runners have been procured from Namur in Flanders, others from Ireland, and a few from Wales.

The stone runners F are turned by two iron spindles, one of which passes through a wooden box in the centre of each of the two stone runners upon each stone bed, and through one of the shafts K. The spindles are 8 feet 6 inches long, 4 inches in diameter, and each weighs about 5 cwt. The shafts I, and K, work into step brasses at bottom, and are fitted to the tie beams at top by two coupling brasses. The step brasses into which the shafts K work, are fixed into wooden boxes, raised about 6 inches above the stone beds, and are surrounded by a circular piece of wood called a cheese, which is about 2 feet 6 inches in diameter, 3 inches thick, and forms the inside of the track of the stone runners upon the stone bed; the curbs marked I, are fitted into grooves near the outer edge of the stone beds, and form the out=sides of the tracks of the stone runners. Two pieces of wood called ploughs are placed between the stone runners, upon each stone bed, one on the inside next the cheese, and one on the outside next the curb, which move round with the runners, being fixed to the shaft K, and keep the composition in their track. Every gunpow=der mill has a clock, which is kept going by a lever applied to the water wheel shaft, and each revolution of the water wheel advances the clock near=ly 12 seconds.

All the gunpowder mills have two stone beds, and two pairs of stone runners, which require a supply of water equal to the power of 8 horses to make the stone runners run round upon the bed stones 7 1/2 times in a minute

* drawing 13

*Utensils used in a gunpowder Mill and shewn on the drawing numbered 13.

F, A stone runner 6 feet in diameter, 1 foot 6 inches thick, weighing about 3 1/2 tons; it is used to amalgamate the composition.

G, A stone bed 8 feet 3 inches in diameter, 1 foot 2 inches in thickness, and weighs about 3 1/2 tons; upon this stone the composition is amal=gamated by the stone runners F.

H, An iron spindle which turns the stone runners F, it is 8 feet 6 inches long, 4 inches in diameter, and weighs about 5 cwt.

a, A copper water pot for liquoring the composition.